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Title:

Physical and mental health outcomes of physical exercise training in young cancer inpatients and survivors - a systematic review of RCTs

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Abstract:

Introduction: Physical activity (PA) is increasingly recognized as a means to mitigate impairments in physical, psychological, cognitive and social functioning in young cancer inpatients and survivors (Braam et al., 2016). Nevertheless, mounting evidence indicates inadequate PA levels in this population that extend into adulthood. To prevent inactivity and related health problems, it is vital to develop and evaluate tailored PA interventions. In order to identify the features of efficacious interventions, the aim of this systematic review was to synthesize the findings from randomized controlled trials (RCTs) investigating the effects of PA interventions on physical and mental health outcomes in young cancer inpatients and survivors.

Methods: We searched in Pubmed, EMBASE and Web of Science (until August 2019) for RCTs of PA interventions in children and adolescents with cancer during and after treatment that reported effects on at least one physical and/or mental health outcome. Two authors identified studies meeting inclusion criteria, extracted data and assessed risk of bias.

Results: From 1141 identified articles, 22 RCTs met the eligibility criteria, leading to a total of 1315 participants aged 1 to18 years (M_{age} = 11.7 years). Studies were conducted with inpatients (10), survivors (10), or both (2). In twenty-one studies, chronic PA interventions (with only one acute PA) including aerobic, resistance or combined motor-cognitive training were carried out. All studies included physical health outcomes (mostly cardiorespiratory fitness, muscle strength and fatigue); 17 included in addition psychological health outcomes (mostly depression and quality of life); three objectively assessed cognitive functions. Benefits were most frequently reported (> 50%) for strength, fatigue and self-efficacy, but differences in training session durations and intervention lengths hinder thorough comparisons. No negative effects were found.

Discussion/Conclusion: PA appears to be safe and feasible for this special population. Chronic PA interventions, particularly for inpatients, mainly focus on enhancing physical fitness and reducing fatigue symptoms. Motor competence is rarely targeted, even though it is a predictor of health and later PA levels (Robinson et al., 2015). Few interventions combine motor and cognitive trainings. This is surprising, since not PA itself, but its cognitive and skill acquisition challenges seem a prerequisite to reap largest cognitive benefits (Tomporowski & Pesce, 2019). Emerging forms of playful technological exercise with physical and cognitive challenges may represent a new frontier to include cognitive and skill acquisition challenges (Benzing et al., 2018). In conclusion, there are some promising results, but more high-quality RCTs are needed to understand how various types of PA influence both motor and cognitive development in young cancer inpatients and survivors.

References:

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